Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Request for Waiver of Sections 90.261(f) and 90.219(d)(3) of the Commission's Rules	)	WT Docket No. _____

REQUEST FOR WAIVER

The Association of American Railroads ("AAR"), by its undersigned counsel and pursuant to Sections 1.3 and 1.925 of the Federal Communications Commission's ("FCC" or "Commission") rules, hereby requests a waiver of certain rules applicable to the use of signal boosters to ensure that its members are able to maintain continuous communications between the fronts and rears of trains.[1] Specifically, the AAR requests a waiver of Sections 90.261(f) and 90.219(d)(3) to allow railroads to use certain frequencies for secondary fixed operations and operate signal boosters with an effective radiated power ("ERP") of up to 30 watts in areas where coverage is unsatisfactory due to distance or intervening terrain barriers. As discussed below, waiver of these rules is in the public interest.

I. BACKGROUND AND DESCRIPTION OF THE AAR'S INTENDED USE FOR SIGNAL BOOSTERS

The AAR is a voluntary non-profit membership organization whose freight railroad members operate 82 percent of the line-haul mileage, employ 95 percent of the workers, and account for 97 percent of the freight revenues of all railroads in the United States.[2] The AAR

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[1] An earlier version of this waiver request was filed on May 9, 2014. After discussions with Mobility Division staff, the AAR is hereby submitting a revised request. This document supersedes the request filed on May 9, 2014.

[2] More information on the AAR is available at its website: https://www.aar.org/Pages/Home.aspx.

has been certified by the Commission as the frequency coordinator for the land mobile frequencies used by the rail industry for dispatcher-to-train lines, onboard communications, train-to-train communications, various types of train control systems, and other industry-specific uses of spectrum.[3]

The AAR recognizes the importance of rail safety and is proud to report that railroads are safer today than ever before.[4] For example, since 2000, the train accident rate has fallen 44 percent, the rail employee injury rate has fallen 51 percent, and the grade crossing collision rate has fallen 45 percent.[5] Still, the safety challenge never ends and, in areas of the country with difficult terrain, one obstacle to safe train operation is the Commission's current limitation on signal booster use.

Railroads rely on private land mobile radio systems to communicate between rail cars on the same train to ensure that rail cars remain coupled, that train engines operate at optimal power levels, and that brake systems are operating normally. This is typically accomplished via a two-way communications link between an end of train ("EOT") device and the head locomotive. The EOT is an electronic device located on the last car of the train that automatically performs functions similar to those that were traditionally performed by the crew on a caboose, such as monitoring the speed of the back of the train and rear-end braking. In addition, many modern

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[3] *See Frequency Coordination in the Private Land Mobile Radio Services*, Report and Order, 103 FCC 2d 1093, 1094 (1986); *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Services*, Second Report and Order, 12 FCC Rcd 14307, 14324, 14330 (1997); *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile* Services, Second Memorandum Opinion and Order, 14 FCC Rcd 8642, 8646-47 (1999); *Waiver of the Commission's Rules to License Use of Six Conventional 900 MHz Frequency Pairs for Advanced Train Control System*, Order, 3 FCC Rcd 427 (PRB 1988); *Modification of Licenses for Use in Positive Train Control Systems*, Order, 16 FCC Rcd 3078 (WTB 2001).

[4] *See* AAR, RAILROADS: MOVING AMERICA SAFELY (2013), *available at* https://www.aar.org/keyissues/Documents/Background-Papers/Railroads-Moving-America-Safely.pdf.

[5] *Id.*

trains use a Distributed Power ("DP") system in which there is an engine at each end of the train. In this configuration, a train's front and rear engines must constantly communicate so that they can work together to move the train safely. For example, when a train goes over a hill, the rear engine may be pushing while the front engine may be braking. Without adequate communications, the engines would operate unsynchronized, which can cause the train to run inefficiently, stress the couplings between train cars, and lead to derailment. The communications link also keeps the train's engineers apprised of potential coupling failures, displays pressure in the train's brake lines, and allows the engineer to apply the train's rear brakes in the case of an emergency. If a potential problem does arise, constant communication between the front and rear of the train is required to ensure that the engineers are alerted and that corrective action can be initiated at the earliest possible moment.

On long trains, communications between the front and the rear can be obstructed in areas of challenging topography, including where tracks make sharp turns around mountain passes or encounter quick inclines and declines along hilly terrain. In these limited locations, railroads need trackside signal boosters to maintain communications. For example, railroads have tremendous issues navigating through the Cascade Mountains in the state of Washington. There, tracks follow low areas through a number of cuts and tunnels. Meanwhile, dense fir tree forests line the tracks and absorb radiofrequency energy, even in the 450 MHz band.

Currently, Section 90.261(f) of the Commission's rules does not allow for secondary fixed operations on the primary frequencies in the 450-470 MHz band allocated for railroad use, which precludes the use of trackside stations. Meanwhile, Section 90.219(d)(3) limits signal booster power levels to 5 watts ERP, which is insufficient to overcome the challenging topographies described above. Accordingly, there is good cause for the Commission to waive

each of these rules to allow railroads to use, in limited circumstances, secondary fixed operations on certain frequencies and signal boosters at up to 30 watts ERP.

II. WAIVER STANDARD

To obtain a waiver of the Commission's rules, an applicant must demonstrate either that: (i) the underlying purpose of the rule at issue would not be served or would be frustrated by its application, and that a waiver is in the public interest; or (ii) in view of the unique circumstances, application of the rule would be inequitable, unduly burdensome or contrary to the public interest.[6] The Commission may also waive any provision of its rules "on its own motion or on petition if good cause therefor is shown."[7] As demonstrated below, the AAR's waiver request meets these standards.

III. THE COMMISSION SHOULD WAIVE SECTIONS 90.261(f) AND 90.219(d)(3) FOR THE SPECIFIC PURPOSE OF ENABLING USE OF RAILROAD SIGNAL BOOSTERS

A. The Underlying Purpose of Section 90.261(f) Would Not Be Served By Application of the Rule in this Case

The underlying purpose of Section 90.261(f)'s exclusion of certain frequencies for full-powered secondary fixed operations would not be served by applying the rule in this case. As the Commission has explained, "the purpose of the exclusion of certain frequencies in Section 90.261(f) from use for full-powered fixed operations is to accommodate low power operations, or to reserve those frequencies for other specialized uses."[8]

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[6] 47 C.F.R. § 1.925(b)(3).

[7] 47 C.F.R. § 1.3. Waiver is appropriate if special circumstances warrant a deviation from the general rule, and such a deviation will serve the public interest. *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) (*citing WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969)).

[8] *City of Lewisburg Request for Waivers of Part 90 Rules to Permit Implementation of Wireless Water Management Systems*, Order, 26 FCC Rcd 10706, 10708-09 ¶ 7 (WTB, 2011).

Allowing railroads to use the 452/457.9XXX frequencies, however, would not cause interference to co-channels or adjacent channels. First, the potential victim frequencies are also railroad frequencies, and the railroads have an interest in minimizing interference on these channels. Second, the signal boosters at issue are usually used in remote areas where there are few other transceivers. Third, the same rugged terrain that limits coverage in these remote areas also limits any potentially interfering signals. Moreover, any co-channel or adjacent channel interference that occurs would be resolved by the railroads and the railroad frequency coordinator, and sufficient spectrum would remain available in the 450-470 MHz band for land mobile operations—including channel pairs designated for low power use.

B. The Underlying Purpose of Section 90.219(d)(3) Would Not Be Served By Application of the Rule in this Case

In the *Signal Booster R&O*, the Commission stated that "5 watts ERP per channel is sufficient for signal boosters in most, if not all, cases to address poor signal coverage in enclosed areas or to fill gaps in coverage."[9] This general assumption, however, does not apply here.

In particular, railroads need stronger signal boosters because the trains they use have grown increasingly long. In fact, freight trains now regularly exceed 10,000 feet in length, which is often too long for the end of train ("EOT") device to maintain a reliable communications link with the unit in the head of the train, especially in areas where varying terrain and/or thick foliage and trees attenuate the signal. This is the case even with the Commission's recent amendment of Section 90.238(e) to permit EOT devices to operate with up to 8 watts transmitter output.[10] The increased length of freight trains increases the efficiency of

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[9] *Amendment of Parts 1, 2, 22, 24 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters*, Report and Order, 28 FCC Rcd 1663, 1671 ¶ 180 (2013) ("*Signal Booster R&O*").

[10] *See Amendment of Part 90 of the Commission's Rules*, Fifth Report and Order, 28 FCC Rcd 5924, 5925-26 ¶¶ 3-4 (2013).

railroad transportation, but it also makes it more difficult to maintain the communications link between the front and rear of the train, which presents safety issues.

Additionally, granting the requested waiver would not significantly increase the potential for interference or oscillation.[11] As mentioned above, the signal boosters would be used in remote areas where there are few other transceivers and where rugged terrain would limit potentially interfering signals. Plus, railroad signal boosters use a "store-and-forward" technique, which allows EOTs to transmit and boosters to retransmit on the same frequency and, in doing so, helps avoid intermodulation and oscillation.[12] This technique would continue to be used with higher powered boosters, which would also limit the potential for interference due to intermodulation and oscillation. Furthermore, if the requested waiver is granted, railroads will likely use higher powered boosters only sparingly, given the costs associated with their operation.[13] Accordingly, the AAR requests that the Commission waive Section 90.219(d)(3) to allow its members to use signal boosters at up to 30 watts ERP in areas where coverage is unsatisfactory due to distance or intervening terrain barriers.[14]

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[11] The Commission cited, as support for its 5 watt ERP limit on signal boosters, comments by several parties noting that allowing signal boosters to operate at power levels above 5 watts creates the potential for interference, making proper antenna isolation more difficult, making oscillation more likely, and possibly leading to the generation of passive intermodulation products which cannot be filtered out of the signal booster distribution system and to radio frequency exposure hazards. *See id.* n.415 (citing comments raising concerns regarding interference from signal boosters with power levels in excess of 5 watts ERP); *Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters*, Notice of Proposed Rulemaking, 26 FCC Rcd 5490, 5522-23 ¶ 88 (2011) (citing concerns that increasing power limits for signal boosters "could increase interference due to the difficulty in obtaining antenna isolation," and that "the devices could exceed FCC and Occupational Safety and Health Administration human exposure levels").

[12] Because a railroad signal booster cannot transmit and receive on the same frequency at the same time, it must store the information and retransmit it after the complete message has been received.

[13] *See, e.g., Amendment of the Commission's Rules Concerning Airport Terminal Use Frequencies in the 450-470 MHz Band of the Private Land Mobile Radio Services*, Report and Order, 20 FCC Rcd 1966, 1986 ¶ 15 (2005) (noting that one drawback of using signal boosters is that they are expensive).

[14] Similar language is included in Section 74.731 of the Commission's rules, which governs the use of television broadcast translators and boosters. *See* 47 C.F.R. § 74.731(a); *see also* 74.1231(a).

C. A Waiver Grant is in the Public Interest

Granting the AAR's request would allow for safer and more efficient rail travel by freight railroads as well as many passenger railroads. For example, higher powered signal boosters would enable the crew in a freight train's front engine to more quickly detect a broken coupling or a pressure leak in a brake line. Higher powered boosters would also enable a train's front and rear engines to better balance their power in areas of poor signal propagation, which reduces the risk of a broken coupling in the first place. In both circumstances, safe and efficient train operation depends on the ability to reliably communicate between the train's front and rear.

D. The AAR Has No Reasonable Alternative to Using Signal Boosters

Obtaining additional authorizations on other frequencies is not a reasonable alternative.[15] The frequencies at issue are railroad frequencies used nationwide for only this purpose; the railroads coordinate their use and depend on them being free from interference. No other readily available frequencies are suitable for train communications because no other readily available frequencies are free from interference nationwide. Moreover, transitioning to any other method of communication would be cost-prohibitive, as the railroads have already standardized on the same frequencies and with the same protocols.

Thus, if the AAR's members are unable to use signal boosters as sought, they will be forced to pass through areas of poor signal propagation without the ability to reliably communicate from one end of the train to the other. This increases the risk that a train's front and rear engines will be unable to balance their powers, which leads to stressed couplings and, eventually, to broken couplings. Furthermore, without communication from the back of the train

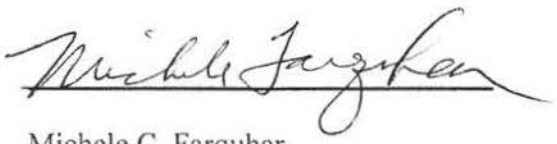
[15] The Commission has stated that "if licensees need more than 5 watts ERP per channel for a particular deployment, they can use other allowances in Part 90, including obtaining an additional authorization for a repeater or base station." *Signal Booster R&O*, 28 FCC Rcd at 1727 ¶ 180.

to the front, the train's engineer would not be alerted in the event of a broken coupling, which means that the train would not stop and could derail.

VII. CONCLUSION

Railroad safety depends on continuous communication between the fronts and rears of trains. To maintain this communication, railroads must be able to use `higher powered boosters on certain frequencies. There is no other reasonable alternative. For the foregoing reasons, the AAR respectfully requests that the Commission grant the waiver request made herein.

Respectfully submitted,



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